

**TURN CONTROL**  
PDI must be centered when Turn Control is used.

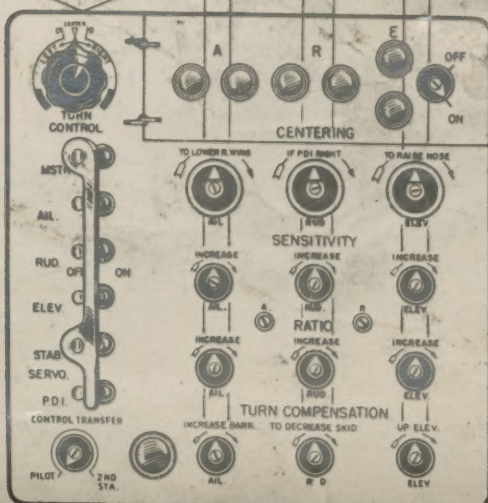
**AILERON**

**RUDDER**

**ELEVATOR**

**CAUTION**

Do not adjust mechanical trim tabs while Autopilot is engaged.



**TELL-TALE LIGHTS**—Must be extinguished in each axis when Autopilot is engaged.

**AUTOPILOT TRIM CONTROLS**—Before engaging, use to put out Tell-Tale lights. After engaging, use in place of trim tabs for small attitude adjustments. \*See note below.

**CONTROLS ALERTNESS OF AUTOPILOT**—Adjust clockwise as far as possible until controls chatter; then counterclockwise until chatter stops.

**REGULATES AMOUNT OF CONTROL SURFACE ACTION**—Adjust clockwise to stop under-control (wallowing). Adjust counterclockwise to stop over-control (hunt).

**ADJUSTS COORDINATION OF CONTROL ACTION**—Adjust when in maximum Stabilizer (Bombardier) turn, as explained below. Readjustment seldom required.

**C-1 AUTOPILOT FLIGHT ADJUSTMENTS**

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**BEFORE TAKE-OFF**

1. All knobs on the Autopilot Control Panel should be turned to "pointers up" position, with Turn Control Knob centered.
2. Center the secondary clutch arm and engage the secondary clutch by turning the clutch engaging knob clockwise.
3. Disengage the directional clutch by pulling the lever towards you.
4. Immediately before take-off check to see that all switches on the A.C.P. are off.

**AFTER TAKE-OFF**

1. After reaching an altitude of 1000 feet, turn on the Master and Stabilizer Switches on A.C.P. (Turn on Tell-Tale lights Switch.)
2. After Master and Stabilizer Switches have been on for 10 to 15 minutes, turn on the P.D.I. Switch and the Servo Switch.
3. When bombing altitude has been reached, with bomb bay doors open, TRIM the ship MANUALLY to fly straight and level "hands off".

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**4. TO ENGAGE AILERON BRAKE SWITCH:**

With wings level, P.D.I. on zero, adjust Aileron Centering Knob until both Tell-Tale lights are out. Immediately turn on the Aileron switch. NOTE: P.D.I. may be centered or zeroed by turning the ship.

**5. TO ENGAGE RUDDER BRAKE SWITCH:**

With P.D.I. on zero, adjust RUDDER Center Knob until both rudder Tell-Tale lights are out. Immediately throw on the RUDDER SWITCH.

**6. TO ENGAGE ELEVATOR BRAKE SWITCH:**

With the airplane level and zero rate of climb, adjust ELEVATOR CENTERING Knob until both elevator Tell-Tale lights are out. Immediately turn on the Elevator Switch.

**7. AILERON SENSITIVITY ADJUSTMENT:**

Turn the Aileron Sensitivity Knob towards maximum (clockwise) until a "system hunt" or control chatter develops. Reduce sensitivity just enough to eliminate this chatter. If no "system hunt" develops, advance sensitivity knob to maximum.

(FOLD HERE)

**8. AILERON RATIO ADJUSTMENT:**

Turn the Aileron Ratio Knob towards maximum (clockwise) until a "SHIP hunt" develops. Then reduce ratio just enough to eliminate the "ship hunt" which, in the case of aileron surface, is characterized by wing oscillating in roll. If no "ship hunt" develops, use maximum ratio setting. Readjust centering, if necessary, after ratio adjustment.

**9. RUDDER SENSITIVITY ADJUSTMENT:**

Turn the Rudder Sensitivity Knob towards maximum (clockwise) until a "system hunt" or control chatter develops. Reduce sensitivity until chatter is eliminated. If no "system hunt" develops, use maximum sensitivity.

10. RUDDER RATIO ADJUSTMENT:

Turn the Rudder Ratio Knob towards maximum (clockwise) until a "ship hunt" develops. Then reduce ratio just enough to eliminate the "ship hunt". In this case, a "ship hunt" is characterized by the yawing of ship. If no "ship hunt" develops, use maximum ratio. It may be necessary to readjust rudder centering after setting rudder ratio.

11. ELEVATOR SENSITIVITY ADJUSTMENT:

Turn the Elevator Sensitivity Knob towards a maximum (clockwise) until a "system hunt" or control chatter develops. Reduce sensitivity just enough to eliminate this chatter. If no "system hunt" develops, use maximum sensitivity.

12. ELEVATOR RATIO ADJUSTMENT:

Turn the Elevator Ratio Knob towards a maximum (clockwise) until a "ship hunt" develops. Then reduce ratio just enough to eliminate "ship hunt" which, in this case, is characterized by pitching of the plane. If no "ship hunt" develops, use maximum ratio setting.

13. USE OF CENTERING KNOBS (Aileron, Rudder, Elevator)

To trim the ship while flying on the autopilot, or to make any change in the plane's attitude made necessary by change in wing loading, Always Use Centering Knobs.

14. TURNS MADE FROM DIRECTIONAL PANEL ---- (ADJUSTMENT FOR COORDINATION)

For turns made from bombardier's compartment, adjustment to get coordinated turns is made on the A.C.P.

(a) The secondary clutch on the stabilizer will be disengaged and the clutch arm moved to one stop or the other and held there while the trimmer knobs (bottom row on A.C.P.) are adjusted.

(b) Adjust Aileron Turn Compensation Trimmer on the A.C.P. until an 18° bank is indicated on the Gyro-Horizon.

(c) Adjust Rudder Turn Compensation Trimmer on the A.C.P. until the ball remains in the center of the inclinometer.

(d) Adjust the Up-elevator Trimmer until the ALTIMETER shows neither gain nor loss of altitude.

(e) Move the Secondary clutch arm to opposite stop and check the degree of bank and observe whether there is slip or skid. If the turn is not coordinated in this direction, check the centering of the wiper arms on the bank and rudder pots in the Directional Panel.

(f) Center the Secondary clutch arm and reengage the clutch.

15. TURNS MADE FROM THE TURN CONTROL --- (ADJUSTMENT FOR COORDINATION)

(a) With P.D.I. centered, rotate the Turn Control Knob clockwise to an indicated 30° turn.

(b) Adjust the T.C. Aileron Trimmer Screw until the Gyro-Horizon shows a 30° bank.

NOTE: This trimmer screw is not the Bank Trimmer Knob used in coordinating turns made from bombardier's compartment.

(c) Adjust the T.C. Rudder Trimmer Screw until the ball rides in the center of the inclinometer.

(d) Take the plane out of the turn-by rotating the Turn Control Knob slowly back to zero position. When wings are nearly level, click the knob into DETENT POSITION.

NOTE: In rough air limit bank made from the turn control to 30° TURNS made while in climb or glide should be 5° less than maximum bank for level flight.

16. DASH POT ADJUSTMENT:

(a) In normal operation, the C-I pilot is adjusted with the knurled nut on the dash pot being 1 1/4 turns up from the bottom.

(b) If (after all settings have been made on A.C.P.) a rapid fish tailing develops due to over control, the knurled nut should be moved up.

(c) If the ship is slow to respond, the knurled nut should be screwed down.

(d) Fish tailing effect is very apt to become apparent after course corrections are put in rapidly from the course knobs on the bombsight.